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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,972	11/01/2001	Steven D. Roach	LT-146	6870

1473 7590 07/16/2003

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EXAMINER

TSAI, CAROL S W

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/015,972

Applicant(s)

ROACH, STEVEN D.

Examiner

Carol S Tsai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-35 is/are pending in the application.
- 4a) Of the above claim(s) 26-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 14 and 17-25 is/are rejected.
- 7) ☒ Claim(s) 12, 15 and 16 is/are objected to.
- 8) ☒ Claim(s) 1-35 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

- I. The species best illustrated by Fig. 1.
- II. The species best illustrated by Fig. 2.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is deemed generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the

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examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. A telephone call was made to Michael Shanahan on 06/20/2003 to request an oral election to the above restriction requirement, and resulted in an election of group I without traverse.

3. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

#### ***Claim Objections***

5. Claims 12, 15, and 16 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 5, 6, 8, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Publication 2002/0050827 to Kronrod et al.

With respect to claims 1-3, 8, and 10, Kronrod et al. disclose a method for determining a current supplied by an integrated circuit comprising: determining a voltage drop across a termination impedance with respect to a reference voltage (see paragraph 0039); comparing a voltage drop across a first impedance on the integrated circuit with a voltage drop across a second impedance on the integrated circuit (see paragraphs 0034-0038); and processing information obtained in the determining and comparing steps to obtain a value for the supplied current (see paragraph 0040-0043).

As to claims 5 and 6, Kronrod et al. also disclose determining an impedance value of the first impedance/determining an impedance value of the second impedance (see paragraphs 0037 and 0038).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 4, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronrod et al. in view of U. S. Patent No. 5,818,292 to Slemmer.

As noted above, with respect to claims 4, 7, and 9, Kronrod et al. disclose the claimed invention, except for dividing the voltage drop across the first impedance by the voltage drop across the second impedance.

Slemmer teaches dividing the voltage drop across the first impedance by the voltage drop across the second impedance (see col. 1, lines 58-62 and col. 6, lines 23-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kronrod et al.'s method to include dividing the voltage drop across the first impedance by the voltage drop across the second impedance, as taught by Slemmer, in order that accurate measurement of the current through the strip can be determined.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kronrod et al. in view of U. S. Patent No. 6,157,206 to Taylor et al.

As noted above, Kronrod et al. disclose the claimed invention, except for dividing the value of the reference voltage by the value of the termination impedance.

Taylor et al. teach dividing the value of the reference voltage by the value of the termination impedance (see col. 7, lines 16-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kronrod et al.'s method to include dividing the value of the reference voltage by the value of the termination impedance, as taught by Taylor et al., in order

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to provide a relatively stable impedance value with which to terminate a transmission line (see Taylor et al. col. 7, lines 60-61).

11. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronrod et al. in view of U. S. Patent No. 6,236,584 to Koo.

As noted above, with respect to claims 13 and 14, Kronrod et al. disclose the claimed invention, except for dividing the value of the voltage drop across the first impedance by the value of the reference voltage/dividing the value of the voltage drop across the second impedance by the value of the reference voltage.

Koo teaches dividing the value of the voltage drop across the first impedance by the value of the reference voltage/dividing the value of the voltage drop across the second impedance by the value of the reference voltage (see col. 2, lines 48-55 and col. 3, lines 40-54).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kronrod et al.'s method to include dividing the value of the voltage drop across the first impedance by the value of the reference voltage/dividing the value of the voltage drop across the second impedance by the value of the reference voltage, as taught by Koo, in order to make a smooth and regular operation (see Abstract, lines 8-9).

12. Claims 17-19, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,451,903 to Armstrong in view of U. S. Publication 2002/0050827 to Kronrod et al.

With respect to claims 17-19, 22, and 25, Armstrong discloses a circuit that determines a

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current supplied by an integrated circuit comprising: a sensing impedance (a control resistor 220 shown on Fig. 3) disposed on the integrated circuit (output driver 100 shown on Fig. 3); a modulation impedance (impedance element 120 shown on Fig. 3); a termination impedance (external impedance load 160 shown on Fig. 3).

Armstrong does not disclose a first measurement device coupled to the modulation and sensing impedances configured to measure voltage drop across each impedance; a second measurement device coupled to the termination impedance configured to measure voltage drop across the termination impedance; and processing circuitry configured to receive information from the first and second measurement devices and calculate supplied current therefrom.

Kronrod et al. teach a first measurement device (A/D convert 218 shown on Fig. 5a) coupled to the modulation and sensing impedances configured to measure voltage drop across each impedance; a second measurement device (A/D convert 218 shown on Fig. 5a) coupled to the termination impedance configured to measure voltage drop across the termination impedance; and processing circuitry (CPU 220 shown on Fig. 5a) configured to receive information from the first and second measurement devices and calculate supplied current therefrom (see paragraphs 0041 and 0042).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Armstrong's system to include a first measurement device coupled to the modulation and sensing impedances configured to measure voltage drop across each impedance; a second measurement device coupled to the termination impedance configured to measure voltage drop across the termination impedance; and processing circuitry configured to receive information from the first and second measurement devices and calculate supplied



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current therefrom, as taught by Kronrod et al., in order that power consumed by a circuit on a printed circuit board can be measured.

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong in view of Kronrod et al. as applied to claim 17 above, and further in view of U. S. Publication 2003/0006747 to Jaussi et al.

As noted above, Armstrong in combination with Kronrod et al. teach all the features of the claimed invention, but do not disclose a trimmed voltage reference.

Jaussi et al. teach a trimmed voltage reference (see paragraphs 0022 and 0066).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Armstrong in combination with Kronrod et al.'s system to include a trimmed voltage reference, as taught by Jaussi et al., in order to bias the variable current sources.

14. Claims 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong in view of Kronrod et al. as applied to claim 17 above, and further in view of U. S. Patent No. 5,687,330 to Gist et al.

As noted above, Armstrong in combination with Kronrod et al. teach all the features of the claimed invention, but do not disclose the termination impedance being a precision resistor.

Gist et al. teach the termination impedance being a precision resistor (see col. 14, lines 22-39).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Armstrong in combination with Kronrod et al.'s system to include the termination impedance being a precision resistor, as taught by Gist et al., in order to compensate for electrical variations caused by aging, temperature, supply voltage and process variations (see Gist et al. col. 14, lines 31-32).

As to claim 23, Armstrong in combination with Kronrod et al. do not disclose the termination resistor being a resistor internal to the integrated circuit.

Gist et al. teach the termination resistor being a resistor internal to the integrated circuit (see col. 8, lines 6-15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Armstrong in combination with Kronrod et al.'s method to include the termination resistor being a resistor internal to the integrated circuit, as taught by Gist et al., in order that signal amplitude can be automatically calibrated based on a precise electrical reference.

As to claim 24, Armstrong also disclose a sinking circuit (sinking transistor 226 shown on Fig. 3) coupled to the modulation resistor.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tripathi discloses the power supply for LEDs of the present invention providing power to a variable number of LEDs wired in series or in parallel.

Gregorius discloses a detection circuit which is configured, in particular, for line drivers for ascertaining the presence of an overshooting of a current flowing through a line above a predetermined value.

Narendra et al. disclose methods and apparatus for generating a MOSFET based voltage reference circuit with automatic trimming of resistors to compensate for process and supply voltage variations and to improve the accuracy of a MOSFET based reference voltage circuit, a temperature compensated MOSFET based reference voltage, and arbitrary translation of the MOSFET based reference voltage with or without trimming are provided.

Montrose discloses a power booster and current measuring circuit providing a quiet, accurate voltage to a load (such as a transistor during parametric testing) with a load current of up to 1 ampere, and can measure that load current to an accuracy of  $\pm 0.1\%$  over a range of currents extending nine orders of magnitude (e.g., 1 ampere to  $10^{-9}$  amperes).

McNitt et al. disclose a termination impedance in a semiconductor circuit being trimmed to fall within a desired range by a trimming circuit such that the amount of variation in the termination impedance is less than the variation in the sheet rho (resistivity) of the semiconductor.

Manohar et al. disclose a method and apparatus for a voltage reference.

Barker discloses a stable voltage regulator circuit of simple circuit configuration including a differential amplifier which is powered from a supply line at a nominal voltage level, by being coupled between the supply line and a return line.

DeVibiss discloses a first terminal of a device-under-measurement (DUM) being connected to the input of a buffer amplifier having its output applied to the inverting input of

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an operational amplifier through a resistor having the value "aR".

Sato et al. disclose a semiconductor laser control method used preferably for a reading control system such as a bar code reading device and to a semiconductor laser control device employing the above method.

Jesser discloses an amplifier having a current determiner to provide an operating current depending on a reference current, the operating current being used to operate an input amplifying device.

### ***Contact Information***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. Tsai whose telephone number is (703) 305-0851. The examiner can normally be reached on Monday-Friday from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703) 308-1677. The fax number for TC 2800 is (703) 308-7382. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (703) 308-1782.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 308-7382. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the

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examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. Tsai

06/24/03

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800